Amendments to the Drawings

Attached is a new FIG. 9 containing corrections. Specifically, items 52 and 61 on the right side of the drawing are now denoted items 52' and 61', respectively, to distinguish them from items 52 and 61, respectively, at the top of the figure. This corresponds to changes made in the paragraphs on page 26 of the specification. No new matter is submitted.

Attachment: Replacement FIG. 9

Remarks

Reconsideration of the subject application is requested in view of the foregoing amendments and the following remarks.

The search performed by the examiner in the course of performing a substantive examination of the claims is appreciated.

The amendments to the specification are to correct readily discernible errors. No new matter is submitted.

The amendments to FIG. 9 are to achieve uniqueness of numbering of designated features. See also certain amendments to page 26 of the specification.

Claims 32-69 are pending. In this paper, claims 32, 38-39, and 48 are amended; all other claims are unchanged.

The allowance of claims 59-69 is acknowledged with thanks. Also, the status of claims 33 and 41-42 as being free of the art of record is noted with thanks.

Support for the amendment to claim 32 can be found in the specification on, for example, page 28, lines 10-14 and 18-23. No new matter is added.

Claim 38 is amended to address the issue (35 U.S.C. §112, first paragraph) raised in paragraph 3 of the Office action, and should clear the way to allowance of this claim.

Support for the amendment to claim 39 can be found in the specification on page 25, lines 3-7. No new matter is added. This amendment addresses the issue (35 U.S.C. §112, first paragraph) raised in paragraph 4 of the Office action. This amendment should clear the way to allowance of claims 39-40 and 43-47.

Support for the amendments to claim 48 can be found in the specification on page 20, lines 12-14; page 22, lines 16-24; see also items 74 and 76 in FIGS. 5, 7, and 8. No new matter is added.

Claims 32, 34, 37, and 48-58 stand rejected for alleged obviousness from prior art discussed in the specification. This rejection is traversed.

The method recited in independent claim 32, as amended, is for adjusting an optical axis in an inspection apparatus that uses a charged particle beam. The method comprises providing the inspection apparatus with a CPB optical system for guiding an observation charged particle beam along the optical axis from an object to a detector. The CPB optical system includes a

cathode lens and an X-Y stage for holding the object. A self-emitting beam source is provided on a surface of the X-Y stage, and an observation charged particle beam is generated from the self-emitting beam source for obtaining an image of the object at the detector. The position of the X-Y stage is determined using the observation charged particle beam to adjust the optical axis.

The prior art discussed in the specification does not teach or suggest providing a self-emitting beam source at any location, including on a surface of the X-Y stage. The fiducial mark mentioned in the Office action is not a self-emitting beam source and does not function as a self-emitting beam source. Furthermore, said prior art does not teach or suggest combining a self-emitting beam source with any combination of the other features set forth in claim 32. Therefore, claim 32, as amended, and its dependents are properly allowable. Each of claims 33-37 that depend from claim 32 adds at least one respective feature to the combination of features in claim 32, and hence is allowable for reasons discussed above regarding claim 32 and for the additional reason that each of these dependent claims sets forth a respective combination of features that is patentable in its own right over said prior art.

Claim 48 as amended is directed to CPB apparatus that comprise an irradiation-optical system, a detection-optical system, a beam deflector, and an off-axis optical system. The irradiation-optical system has a respective optical axis and is situated and configured for guiding a charged particle beam from a beam source to a surface of a specimen on a stage. The detection-optical system is situated and configured for detecting the charged particle beam from the surface and for producing an image of the surface, and the detection-optical system and irradiation-optical system are situated in a vacuum environment. The beam deflector is provided in at least one of the irradiation-optical system and detection-optical system. The off-axis optical system has an optical axis situated at a predetermined distance from the axis of the irradiation-optical system. The off-axis optical system is configured to illuminate the specimen with an optical alignment beam that passes from outside the vacuum environment through a vacuum window and through an objective lens that is situated in the vacuum environment so as to align the specimen with the axis of the irradiation-optical system.

A conventional off-axis optical system is a light microscope of which the objective lens is situated outside the vacuum environment because, according to conventional thinking, the objective lens cannot be separated from the microscope. As a result, light from the specimen

(located in the vacuum environment) must pass through the vacuum window to the objective lens (located outside the vacuum environment). Such conventional placement of the window between the specimen and the objective lens is disadvantageous because the window in such a location imparts various distortions and aberrations to the image that substantially degrade the optical resolution of the image being produced by the light microscope. This degradation of image resolution substantially decreases the accuracy of obtainable alignment between the optical system and the irradiation-optical system.

The system of claim 48, in contrast, achieves much greater image resolution by situating the objective lens of the microscope in the vacuum environment itself. Such placement of the objective lens eliminates having to situate an image-degrading element (the window) between the specimen and the objective lens.

Therefore, claim 48 as amended is properly allowable over said prior art.

All claims depending from claim 48 include all the features recited in claim 48. Hence, these claims are properly allowable for all the reasons discussed above regarding claim 48 and for the additional reason that each of these dependent claims recites at least one respective feature that, when included with the combination of claim 48, is patentable in its own right.

All the pending claims are now in condition for allowance, and early action to such end is requested.

Applicants are entitled to an interview at this stage of prosecution. If any issues remain after consideration and entry of this paper, the examiner is requested to contact the undersigned to schedule a telephonic interview. If the examiner does not make such contact and issues a subsequent Office action, then the undersigned will request an interview later, as a matter of right, during prosecution of the instant application.

Respectfully submitted,

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